RESEARCH ARTICLE

Risk perception of medicinal marijuana in medical students from northeast Mexico [version 1; referees: awaiting peer review]

Sandra Castillo-Guzmán[1], Dionicio Palacios-Ríos[1], Teresa A. Nava-Obregón[1], Julio C. Arredondo-Mendoza[1], Olga V. Alcalá-Alvarado[1], Sofía A. Alonso-Bracho[1], Daniela A. Becerril-Gaitán[1], Omar González-Santiago[2]

[1]Pain and Palliative Care Clinic, Anesthesiology Service, Hospital Universitario Dr. José E. González y Facultad de Medicina, Universidad Autónoma de Nuevo León, Monterrey, Nuevo León, Mexico

[2]Postgraduate in Pharmacy, Faculty of Chemical Science, Universidad Autónoma de Nuevo León, San Nicolas de Los Garza, Nuevo León, Mexico

v1 **First published:** 04 Oct 2017, **6**:1802 (doi: 10.12688/f1000research.12638.1)
Latest published: 04 Oct 2017, **6**:1802 (doi: 10.12688/f1000research.12638.1)

Abstract

Background. Several studies have shown support from the public toward the use of medicinal marijuana. In this cross-sectional study, we assess the risk perception to medicinal marijuana in a sample of medical students.
Methods. To estimate risk perception, a visual scale that ranges from 0 cm (without risk) to 10 cm (totally risky) was used. Risk perception was expressed as the median of the cm marked over the scale. Differences among groups was tested with the Mann-Whitney and Kruskal-Wallis tests, as appropriate.
Results. 283 students participated in the study. Risk perception to medicinal marijuana was 4.22, paracetamol 1.56 and sedatives 5.0. A significant difference in risk perception was observed in those that self-reported to smoke and consume alcohol.
Conclusions. Risk perception of medicinal marijuana is 4.22 in medical students of northeast of Mexico. Students may underestimate its adverse effects. More studies with respect to this are needed.

Open Peer Review

Referee Status: *AWAITING PEER REVIEW*

Discuss this article

Comments (0)

Corresponding author: Omar González-Santiago (omargs28@yahoo.com)

Author roles: Castillo-Guzmán S: Conceptualization, Writing – Review & Editing; **Palacios-Ríos D**: Formal Analysis, Methodology; **Nava-Obregón TA**: Formal Analysis, Methodology; **Arredondo-Mendoza JC**: Data Curation, Investigation; **Alcalá-Alvarado OV**: Investigation, Writing – Original Draft Preparation; **Alonso-Bracho SA**: Investigation, Writing – Original Draft Preparation; **Becerril-Gaitán DA**: Investigation, Writing – Original Draft Preparation; **González-Santiago O**: Conceptualization, Supervision, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

How to cite this article: Castillo-Guzmán S, Palacios-Ríos D, Nava-Obregón TA *et al.* **Risk perception of medicinal marijuana in medical students from northeast Mexico [version 1; referees: awaiting peer review]** *F1000Research* 2017, **6**:1802 (doi: 10.12688/f1000research.12638.1)

Grant information: The author(s) declared that no grants were involved in supporting this work.

First published: 04 Oct 2017, **6**:1802 (doi: 10.12688/f1000research.12638.1)

Introduction

Several studies have showed the potential benefits of medicinal marijuana (MM) for the treatment of some illnesses, such as pain in cancer, multiple sclerosis, Alzheimer's disease, post-traumatic stress disorder, epilepsy, Crohn's disease, and glaucoma[1,2]. However, like other drugs, MM is not exempt from serious adverse effects, such as psychiatric disorders, euphoria, disorientation, confusion, somnolence, and fatigue; therefore, it should be used with extreme caution[3]. Legally, physicians cannot prescribe MM; however, in some countries, they can recommend its use when they consider it necessary. Some recommendations on how to prescribe marijuana for the care of patients have been published previously[4].

On the other hand, risk perceptions towards medicinal drugs have been reported that influence in the prescribing behavior and the willingness of physicians to report adverse drug reactions. Knowing the risk perceived by medical students to drug prescription is important, since it establishes the requirement of education regarding certain medicines, like MM. In this respect, there are no studies regarding the risk perception toward MM in the general population and among health professionals. The existing literature has focused mainly on attitudes and support toward its legalization. Across countries, the factors associated with support for its legalization are political tolerance, ideology, and the views toward government[5].

In Mexico, as in others countries, the use of MM was prohibited; however, in December 2016, the Senate approved the legalization of MM and sent the bill to the Chamber of Representatives for ratification, which occurred on April 28, 2017. The next steps for its appropriate use include the publication of laws, regulations, and guidelines by the Health Ministry, medical schools, and medical associations. While this continues, it is important that health professionals be updated on this topic, so that they can rationally recommend the use of MM. To achieve this, a first approach would be to know the attitudes and willingness to recommend the use of MM, and the risk perceived by physicians. In this study, we evaluate the risk perception of MM in medical students from northeast Mexico and determine associated factors.

Methods

Study design

A cross-sectional study that uses a visual scale to estimate risk perception of MM. The survey was applied during July and August 2017 in a public university from northeast of Mexico.

Participants

The inclusion criteria were as follow: Medical students of Universidad Autónoma de Nuevo León, both genders, any semester of study, and ages older than 18 years. Participants with incomplete surveys of second section were excluded. The medical students were contacted personally in the study areas and halls of the Faculty of Medicine. After obtaining verbal consent the survey was applied. This was self-administered with supervision. This study was performed in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of the Faculty of Medicine at Universidad Autónoma de Nuevo León (registration number PI17-00134). Only verbal consent was requested from participants because the study is of low risk. This type of consent was approved by the Ethics Committee.

Instrument

The survey used was composed of two sections, the first section, which was optional, collected demographic information, such as age, gender, semester of study, self-reported alcohol and smoking status (undefined level, only yes or no), and currently self-reported disease (unspecific, only yes or no). The second section evaluates the risk perception toward the use of MM. For this, a visual scale of 10 cm, from 0 cm (without risk) to 10 cm (completely risky), was used. Participants marked over the scale the risk that they perceived when MM is used. This section also contained two additional scales for paracetamol and sedatives, which act as relatively safe (negative control) and risky (positive control) drugs, respectively. The order of scales, including MM, was randomly allocated. The use of this visual 10-cm scales has been used previously in studies that assess the risk perception to other medicinal drugs[6–8]. The complete survey is available as Supplementary File 1.

Statistical analysis

Descriptive statistics is reported for demographic data. Risk perception was reported as the median of centimeters marked over the scale (from 0 to the mark). The results of risk perception were grouped by three age groups (18–20, 21–23 and >23 years), gender, semester of study (1–3, 4–7 and >7 semester), and self-reported alcohol and smoking status. Differences among groups were evaluated with the Mann-Whitney and Kruskal-Wallis tests, as appropriate. The statistical package NCSS version 11 was used for all analysis. The level of significance was $p < 0.05$.

Results

Overall, the rate of response was 97%. In total 283 students were interviewed, of which 50.8% were men; 61% had an age range of 21–23 years, and 62.8% were enrolled in semesters 8 or higher. In addition, 18.7% self-reported smoking, 48.1% consuming alcohol and 14.1% self-reported having a (unspecified) disease (Table 1).

Overall, the risk perception of MM was 4.22 cm, while for paracetamol and sedatives it was 1.56 and 5.00 cm, respectively (Figure 1). The observed differences among the three drugs were statistically significant ($P < 0.05$). This pattern was similar according to gender, age, semester of study, smoking and alcohol consumption and having some (unspecified) disease.

The analysis of individual drugs did not show a significant difference between gender, smoking and alcoholism status, having a disease, or among age groups and the semester of study in the risk perception of paracetamol and sedatives (Table 2). However, a significant difference was observed between self-reported smoking and alcohol consumption in the risk perception of MM. Those that self-reported smoking or alcoholism had a lower risk perception of MM.

Table 1. Sociodemographic characteristics of participants.

Variable	N	%
Total	283	100
Gender		
Male	144	50.8
Female	139	49.1
*Age**		
18–20	71	25.6
21–23	169	61.0
>24	37	13.4
*Semester of study**		
1–3	49	17.4
4–7	56	19.9
>8	177	62.8
Smoking		
Yes	53	18.7
No	230	81.3
Alcohol		
Yes	136	48.1
No	147	51.9
Have a disease		
Yes	40	14.1
No	243	85.9

* Some data are missing due to participants that did not respond to the questions.

Table 2. Risk perception of medicinal marijuana (MM) by sociodemographic characteristics in medical students, using a visual scale with the median of cm.

Variable	MM	Paracetamol	Sedatives	P value
Total	4.22	1.56	5.00	**<0.01**
Gender				
Male	3.95	1.22	4.89	**<0.01**
Female	4.44	1.44	5.00	**<0.01**
P value	0.17	0.83	0.66	
Age				
18–20	4.22	1.33	5.22	**<0.01**
21–23	4.22	1.39	4.89	**<0.01**
>24	4.00	1.56	4.89	**<0.01**
P value	0.64	0.89	0.28	
Semester of study				
1–3	3.00	1.22	4.84	**<0.01**
4–7	4.67	1.22	4.78	**<0.01**
>8	4.22	1.56	5.00	**<0.01**
P value	0.19	0.36	0.69	
Smoking				
Yes	2.78	1.22	4.89	**<0.01**
No	4.39	1.44	5.00	**<0.01**
P value	**0.02**	0.28	0.91	
Alcohol				
Yes	3.67	1.22	5.00	**<0.01**
No	4.56	1.56	4.89	**<0.01**
P value	**0.03**	0.16	0.66	
Have a disease				
Yes	4.11	2.56	4.78	**<0.01**
No	4.22	1.33	5.00	**<0.01**
P value	0.71	0.15	0.71	

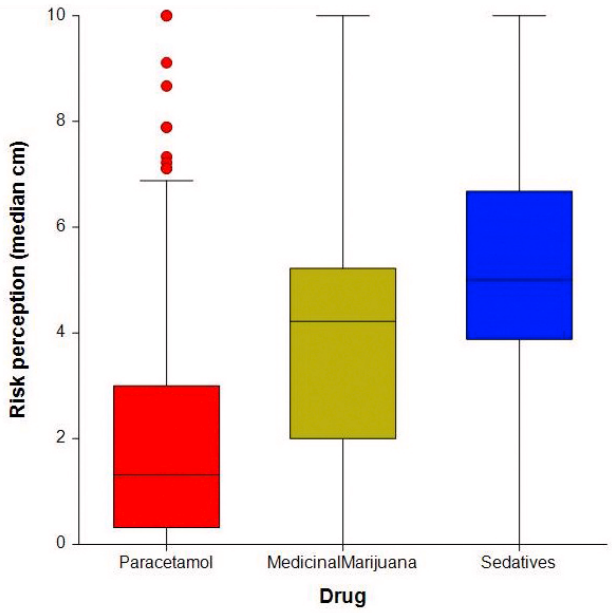

Figure 1. Risk perception of medicinal marijuana among medical students in northeast of Mexico. Two additional scales for paracetamol and sedatives are included, which act as relatively safe (negative control) and risky (positive control) drugs.

Dataset 1. Raw data of risk perception to medicinal marijuana in medical students

http://dx.doi.org/10.5256/f1000research.12638.d179069

Discussion

In this study, we assessed the risk perceived by medical students toward the use of MM. Previous reports have analyzed the risk perception to several drug prescriptions; however, this is the first study that analyzes the risk perception to MM using the same instrument that these studies used.

Although several studies in the general population and among health professionals have shown a support for the legal use of MM[9–12], physicians undoubtedly require solid knowledge of both its benefits and adverse effects if they want recommend it appropriately. Our results show that the risk perceived to MM (4.2 cm) is higher than paracetamol but lower than sedatives in Mexican medical students. Compared with other studies, the risk perceived is similar to the risk perceived to antibiotics, hypocholesterolemia drugs, and antihypertensives (median range 3–5 cm), but lower than that to nonsteroidal anti-inflammatory drugs (NSAIDs), antidepressants, and anticoagulants (median > 6 cm)[6–8,13]. Although the objective was not to establish whether perceived risk was adequate, we speculate that observed outcome is low. We think that a reasonable risk perception of MM should be more than 6, close to other drugs as sedatives, antidepressants or anticoagulants.This due to the difficulty of dosing, specifically if it is smoked, and the frequency of adverse effects of MM. We speculate that students with risk perception values of MM lower than 5 could underestimate its adverse effects and probably could recommend it indiscriminately during their practice. More studies concerning this are needed.

On the other hand, the risk perception of paracetamol was low and is similar to that previously reported[14]. The implications of this finding could be the same as with MM; students could underestimate its adverse effects, which is mainly liver damage[15]. It is worth remembering that lack of awareness of potential harm from taking or administering paracetamol improperly in adults and adolescents is a cause of emergency department visits[16].

An interesting result was the significant difference in risk perception between those that self-reported smoking and alcohol consumption. The users of these recreational drugs had a lower risk perception of MM. In this sense, it has been proven in previous studies that tobacco and alcohol consumption are risk factors for the use of recreational marijuana[17,18]. In addition, the consumption of these drugs has been associated with support for legalization of recreational and MM[19,20].

The risk perception observed could be due in part to attention from mass media regarding its potential uses. Previous studies have found an association between public support for MM and its coverage in media[21,22]. Another factor that could impact risk perception values, is the lack of formal courses regarding MM in the syllabus of students surveyed[23]. In this sense, previous studies have proven that formal courses of pharmacology increase risk perception toward common drugs like NSAIDs[7]. The design and implementation of formal courses regarding MM may have the same impact.

Finally, we consider that our results should be interpreted with caution, as it is possible that our findings may not be generalized to other countries, due to differences in teaching methods. Replication in others countries, especially where the use of MM has been recently made legal, is needed. Although the risk perception of drugs has been studied with visual scales, the development of other instruments could improve the assessment.

Conclusions

The risk perception of MM was 4.22 in medical students of the northeast of Mexico. With the legalization of MM in Mexico, formal courses regarding dosing, and adverse and beneficial effects of MM will be needed in medical schools.

Ethical statement

This study was performed in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of the Faculty of Medicine (registration number, PI17-00134).

Data availability

Dataset 1: Raw data of risk perception to medicinal marijuana in medical students. doi, 10.5256/f1000research.12638.d179069[24]

Competing interests

No competing interests were disclosed.

Grant information

The author(s) declared that no grants were involved in supporting this work.

Acknowledgements

To all medical students that participated in this study. To Dr Sergio Lozano for his help in the edition of manuscript.

Supplementary material

Supplementary File 1: Survey in English and Spanish.

Click here to access the data.

References

1. Whiting PF, Wolff RF, Deshpande S, *et al.*: **Cannabinoids for Medical Use: A Systematic Review and Meta-analysis.** *JAMA.* 2015; **313**(24): 2456–2473.
PubMed Abstract | Publisher Full Text
2. Wilkie G, Sakr B, Rizack T: **Medical Marijuana Use in Oncology: A Review.** *JAMA Oncol.* 2016; **2**(5): 670–675.
PubMed Abstract | Publisher Full Text
3. Ciccone CD: **Medical Marijuana: Just the Beginning of a Long, Strange Trip?** *Phys Ther.* 2017; **97**(2): 239–248.
PubMed Abstract | Publisher Full Text
4. Chaudhry HJ, Hengerer AS, Snyder GB: **Medical Board Expectations for Physicians Recommending Marijuana.** *JAMA.* 2016; **316**(6): 577–578.
PubMed Abstract | Publisher Full Text
5. Cruz JM, Queirolo R, Boidi MF: **Determinants of public support for marijuana legalization in uruguay, the united states, and el salvador.** *J Drug Issues.* 2016; **46**(4): 308–325.
Publisher Full Text
6. Bongard V, Ménard-Taché S, Bagheri H, *et al.*: **Perception of the risk of adverse drug reactions: differences between health professionals and non health professionals.** *Br J Clin Pharmacol.* 2002; **54**(4): 433–436.
PubMed Abstract | Publisher Full Text | Free Full Text
7. Durrieu G, Hurault C, Bongard V, *et al.*: **Perception of risk of adverse drug reactions by medical students: influence of a 1 year pharmacological course.** *Br J Clin Pharmacol.* 2007; **64**(2): 233–236.
PubMed Abstract | Publisher Full Text | Free Full Text
8. Buendia JA, Zuluaga AF: **[Physicians´ insight about adverse drug reaction to frequently used medication groups in Bogotá (Colombia)].** *Biomedica.* 2014; **34**(3): 403–8.
PubMed Abstract
9. **Support increases for marijuana legalization | Pew Research Center [Internet].** [cited 2017 May 5].
Reference Source
10. Millhorn M, Monaghan M, Montero D, *et al.*: **North americans' attitudes toward illegal drugs.** *J Hum Behav Soc Environ.* 2009; **19**(2): 125–141.
Publisher Full Text
11. Chan MH, Knoepke CE, Cole ML, *et al.*: **Colorado Medical Students' Attitudes and Beliefs About Marijuana.** *J Gen Intern Med.* 2017; **32**(4): 458–463.
PubMed Abstract | Publisher Full Text | Free Full Text
12. Kondrad E, Reid A: **Colorado family physicians' attitudes toward medical marijuana.** *J Am Board Fam Med.* 2013; **26**(1): 52–60.
PubMed Abstract | Publisher Full Text
13. Cullen G, Kelly E, Murray FE: **Patients' knowledge of adverse reactions to current medications.** *Br J Clin Pharmacol.* 2006; **62**(2): 232–236.
PubMed Abstract | Publisher Full Text | Free Full Text
14. Castillo-Guzman S, González-Santiago O, Delgado-Leal IA, *et al.*: **Perception of the risk of adverse reactions to analgesics: differences between medical students and residents.** *PeerJ.* 2016; **4**: e2255.
PubMed Abstract | Publisher Full Text | Free Full Text
15. Tittarelli R, Pellegrini M, Scarpellini MG, *et al.*: **Hepatotoxicity of paracetamol and related fatalities.** *Eur Rev Med Pharmacol Sci.* 2017; **21**(1 Suppl): 95–101.
PubMed Abstract
16. Budnitz DS, Lovegrove MC, Crosby AE: **Emergency department visits for overdoses of acetaminophen-containing products.** *Am J Prev Med.* 2011; **40**(6): 585–592.
PubMed Abstract | Publisher Full Text
17. von Sydow K, Lieb R, Pfister H, *et al.*: **What predicts incident use of cannabis and progression to abuse and dependence? A 4-year prospective examination of risk factors in a community sample of adolescents and young adults.** *Drug Alcohol Depend.* 2002; **68**(1): 49–64.
PubMed Abstract | Publisher Full Text
18. Iglesias V, Cavada G, Silva C, *et al.*: **[Early tobacco and alcohol consumption as modifying risk factors on marijuana use].** *Rev Saude Publica.* 2007; **41**(4): 517–522.
PubMed Abstract | Publisher Full Text
19. Sznitman SR, Bretteville-Jensen AL: **Public opinion and medical cannabis policies: examining the role of underlying beliefs and national medical cannabis policies.** *Harm Reduct J.* 2015; **12**: 46.
PubMed Abstract | Publisher Full Text | Free Full Text
20. Van der Sar R, Brouwers EPM, van de Goor LAM, *et al.*: **The opinion on Dutch cannabis policy measures: A cross-sectional survey.** *Drugs Education Prevention and Policy.* 2011; **18**(3): 161–171.
Publisher Full Text
21. Sznitman SR, Lewis N: **Is cannabis an illicit drug or a medicine? A quantitative framing analysis of Israeli newspaper coverage.** *Int J Drug Policy.* 2015; **26**(5): 446–452.
PubMed Abstract | Publisher Full Text
22. Santos MT, Camacho I: **El tratamiento del cannabis en la prensa española.** *Cuadernos info.* 2017; 153–171.
Publisher Full Text
23. **Programa Académico | Universidad Autónoma de Nuevo León. Facultad de Medicina [Internet].** [cited 2017 Sep 10].
Reference Source
24. Castillo-Guzmán S, Palacios-Ríos D, Nava-Obregón TA, *et al.*: **Dataset 1 in: Risk perception of medicinal marijuana in medical students from northeast Mexico.** *F1000Research.* 2017.
Data Source